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| KING & SPALDING LLP 1180 PEACHTREE STREET ATLANTA, GA 30309-3521 | | | EXAMINER GAKH, YELENA G | |
| | | | ART UNIT 1797 | PAPER NUMBER |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/751,368

Applicant(s)

STOCKMAN ET AL.

Examiner

Yelena G. Gakh, Ph.D.

Art Unit

1797

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 March 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) 3, 5-8, 10, 11, 14, 15, 17, 20, 21 and 23-28 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-2, 4, 9, 12-13, 16, 18-19 and 22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

1. Amendment filed on 03/24/08 is acknowledged. Claims 1-28 are pending in the application. Claims 3, 5-8, 10-11, 14-15, 17, 20-21 and 23-28 are withdrawn from consideration. Claims 1-2, 4, 9, 12-13, 16, 18-19 and 22 are considered on merits.

Response to Amendment

2. The examiner withdraws objection to claims 18, 19 and 22. Rejection of the pending claims under 35 U.S.C. 112, second paragraph, is slightly modified in view of the amendment. The rejection of the claims over the prior art is maintained.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-2, 4, 9, 12-13, 16, 18-19 and 22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites "at least one object" contained in an active medium, as a physical element. The expression "transition of the at least one object" is not a clear and definite expression, since "transition" of the structural element can be considered as moving the structural element in the space. If the Applicants meant to recite energy transition that the object undergoes, then the language of the claim should be amended to make it clearer, as to what type of transition the object undergoes.

Also, the expression "the application of the energy source to the active medium" does not seem to be technically correct. The examiner suggests amending the expression by reciting "application of energy from the energy source to the active medium".

The added clause "wherein the stimulated emission causes the buildup of a macroscopic number of surface plasmons in the at least one surface plasmon mode" is a functional language of the claim, which does not further limit the structure of the apparatus recited in the claim. The examiner considers any apparatus comprising the same structural elements as those recited in the

body of the claim before the "wherein" clause, as possessing the same property as recited in this expression.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

5. **Claims 1-2, 4, 9, 12-13, 16, 18-19 and 22** are rejected under 35 U.S.C. 102(a) as being anticipated by Kulakovich et al. (NanoLetters, 2002) (Kulakovich).

Kulakovich discloses an apparatus comprising a resonant medium having at least one surface plasmon mode therein (gold nanoparticles) and the active medium comprised of quantum dots in form of (CdSe)ZnS nanocrystals (see Abstract). "The spherical monodisperse colloidal gold nanoparticles exhibit a well-defined plasmon resonance around 550 nm [visible light], which can be used to excite resonantly the (CdSe)ZnS nanocrystals" (page 1449, right column). Quantum dots are covered with sodium mercaptoethylsulfonate (SMRES) (see page 1450, left column). Since the structure of the apparatus disclosed by Kulakovich fully corresponds to the structure of the apparatus recited in the pending claims, it inherently possesses the same functional properties and characteristics, as the one recited in "wherein" clause of claim 1.

6. **Claims 1-2, 9, 12-13, 16, 18-19 and 22** are rejected under 35 U.S.C. 102(a) as being anticipated by Shimizu et al. (Phys. Rev. Lett, Sept. 2002) (Shimizu).

Shimizu discloses an apparatus comprising a resonant medium having at least one surface plasmon mode therein (rough gold film) and the active medium comprised of quantum dots in form of (CdSe)ZnS nanocrystals (see Abstract and page 117401-1, right column). According to the Abstract: "the fluorescence behavior of single CdSe(ZnS) core-shell nanocrystal (NC) quantum dots is dramatically affected by electromagnetic interactions with a rough metal film. Observed changes including a fivefold increase in the observed fluorescence intensity of single NCs, a striking reduction in their fluorescence blinking behavior, complete conversion of the emission polarization to linear, and single NC excitation lifetimes that are 10^3

times faster. The enhanced excited state decay process for NCs coupled to rough metal substrates effectively competes with the Auger relaxation process, allowing us to observe both charged and neutral exciton emission from these N quantum dots". "Single NCs were dispersed by spin-coating dilute samples directly on the gold substrates, and the 514 nm line [visible range or electromagnetic spectrum] of an Ar ion cw laser was used for sample excitation" (page 117401-1, right column).

Since the structure of the apparatus disclosed by Shimizu fully corresponds to the structure of the apparatus recited in the pending claims, it inherently possesses the same functional properties and characteristics, as the one recited in "wherein" clause of claim 1.

Response to Arguments

7. Applicant's arguments filed 03/24/08 have been fully considered but they are not completely persuasive. The examiner withdraws most of the rejections under 35 U.S.C. 112, second paragraph. Regarding rejection over the prior art, as the examiner indicated above, the functional characteristics of the apparatus recited at the end of claim 1 do not further define or limit the structure of the apparatus, and therefore all apparatus of the similar structure as the one recited in the claims inherently possess the same functional characteristics.

The Applicants' arguments obviously are directed toward description of the function of the apparatus recited in the prior art, rather than to their structure. Observation of stimulated emission is a method step. The examiner is not quite sure, as to what the condition $\alpha_n > 0$ might be. The Applicants are respectfully reminded, that according to CFR 37 §1.57 (c), "[e]ssential material" may be incorporated by reference, but only by way of an incorporation by reference to a **U.S. patent or U.S. patent application publication**, which patent or patent application publication does not itself incorporate such essential material by reference."

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yelena G. Gakh, Ph.D. whose telephone number is (571) 272-1257. The examiner can normally be reached on 9:30 am - 6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill A. Warden can be reached on (571) 272-1267. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Yelena G. Gakh/
Primary Examiner, Art Unit 1797

05/14/2008